

Claims

- [c1] A ceramic micro well plate comprising:
a first ceramic greensheet;
at least one vertical opening in said first ceramic greensheet, said vertical opening in said first ceramic greensheet being a reaction chamber of said micro well plate;
a second ceramic greensheet;
at least one vertical opening in said second ceramic greensheet that is aligned with said at least one vertical opening in said first ceramic greensheet; and
an optical micro plug in said at least one vertical opening in said second ceramic greensheet, whereby said optical micro plug allows viewing of said reaction chamber of said micro well plate.
- [c2] The ceramic micro well plate of claim 1 wherein said first and second ceramic greensheets are laminated to one another.
- [c3] The ceramic micro well plate of claim 1 wherein said first and second ceramic greensheets are sintered greensheets.
- [c4] The ceramic micro well plate of claim 1 wherein said op-

tical micro plug comprises an optically effective material selected from the group consisting of PDMS, PDMS plus a low concentration of capture molecules, glass, silica, ceramic, polymer and combinations thereof.

[c5] The ceramic micro well plate of claim 1 wherein said optical micro plug comprises a lens.

[c6] The ceramic micro well plate of claim 1 wherein said optical micro plug comprises a magnet.

[c7] The ceramic micro well plate of claim 1 wherein said optical micro plug comprises a sensor.

[c8] The ceramic micro well plate of claim 1 wherein said optical micro plug includes marker molecules residing therein having high affinity to their target for identification and quantification of said target.

[c9] The ceramic micro well plate of claim 1 wherein said optical micro plug comprises a conductive optical micro plug.

[c10] The ceramic micro well plate of claim 1 wherein said optical micro plug comprises a non-conductive optical micro plug.

[c11] The ceramic micro well plate of claim 1 wherein said optical micro plug comprises a heater.

[c12] The ceramic micro well plate of claim 1 wherein said optical micro plug comprises a cooler.

[c13] A ceramic micro well plate comprising:
a first ceramic greensheet;
a first plurality of vertical openings in said first ceramic greensheet, said first plurality of vertical openings in said first ceramic greensheet being a plurality of reaction chambers;
a second ceramic greensheet;
a plurality of horizontal openings in said second ceramic greensheet, selected ones of said plurality of horizontal openings connecting selected ones of said first plurality of vertical openings;
a third ceramic greensheet;
a second plurality of vertical openings in said third ceramic greensheet aligned with said first plurality of vertical openings in said first ceramic greensheet; and
a plurality of optical micro plugs in said second plurality of vertical openings, said plurality of optical micro plugs aligned with said first plurality of vertical openings to allow viewing of said reaction chamber of said micro well plate.

[c14] The ceramic micro well plate of claim 13 wherein said plurality of optical micro plugs comprise a transparent

material selected from the group consisting of PDMS, PDMS in combination with capture molecules, glass, silica, ceramic, polymer and combinations thereof.

[c15] The ceramic micro well plate of claim 13 wherein said plurality of optical micro plugs are selected from the group consisting of optical micro plug lenses, optical conductive micro plugs, optical non-conductive micro plugs, optical micro plug heaters, optical micro plug coolers, optical micro plug magnets, optical micro plug sensors and combinations thereof.

[c16] A method of forming a ceramic micro well plate comprising:
providing a first ceramic greensheet;
forming a first plurality of vertical openings in said first ceramic greensheet, each of said first plurality of vertical openings in said first ceramic greensheet being reaction chambers of said micro well plate;
providing a second ceramic greensheet;
forming a second plurality of vertical openings in said second ceramic greensheet;
aligning said first plurality of vertical openings in said first ceramic greensheets with said second plurality of vertical openings in said first ceramic greensheet; and
depositing an optically effective material into said second plurality of vertical openings in said second ceramic

greensheet to form a plurality of optical micro plugs, whereby said optical micro plugs allow viewing of said reaction chambers of said micro well plate.

- [c17] The method of claim 15 further including the steps of: providing a third ceramic greensheet; forming a plurality of horizontal openings in said third ceramic greensheet; and positioning said third ceramic greensheet between said first and second ceramic greensheets such that selected ones of said plurality of horizontal openings connecting selected ones of said first plurality of vertical openings while said plurality of optical micro plugs are aligned with said first plurality of vertical openings being said reaction chambers.
- [c18] The method of claim 16 further including laminating said first and second greensheets to form said micro well plate having said plurality of optical micro plugs.
- [c19] The method of claim 18 further including sintering said laminated first and second greensheets to form said micro well plate having said plurality of optical micro plugs.
- [c20] The method of claim 16 wherein said formed plurality of optical micro plugs are selected from the group consisting of optical micro plug lenses, optical conductive micro

plugs, optical non-conductive micro plugs, optical micro plug heaters, optical micro plug coolers, optical micro plug magnets, optical micro plug sensors and combinations thereof.